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always sufficient land for the population without undue pressure on the forests. A result of British rule has been to increase the population and correspondingly to reduce the rest period of the soil. The consequences have been deforestation and soil erosion. For that reason the authorities have attempted to stop this mode of land use.

In Java shifting cultivation attracted the attention of the government as early as the beginning of the nineteenth century. It was practiced especially in the mountains. The fact that a shifting cultivator required more land than a peasant who cultivated the same piece of land year after year made shifting cultivation extremely undesirable to a colonial administration that wanted to use all available land for the production of cash crops—either under the "forced culture system" of 1830 to 1870[21] or under the private plantation system that has existed since 1870. This circumstance, together with an alarming increase in population, prompted the government to do everything possible to stop the practice of shifting cultivation in Java, and today it is found only in the quite thinly settled residency of Bantam in West Java.[22] In the Outer Islands, with their sparse population and large forest areas, it is widely practiced. But, in contrast to their predecessors, Dutch officials of recent times rarely use the term *Raubbau* for shifting cultivation. Instead they consider this form of land use justifiable if the abandoned fields revert to forest and have the possibility of regaining their former fertility. In the past fifteen years, however, warning voices have pointed out that in large parts of the Outer Islands ladang culture has become a source of destruction, for the forest is no longer being given an opportunity to recuperate.[23] Both agricultural and forestry officials have consequently become concerned over shifting cultivation. In 1930 Hagreis presented a paper on ladang culture before the congress of officials of the Agricultural Advisory Service in the Netherlands Indies.[24] At that time it was decided to appoint a special commission to study ladang culture.[25] The foresters, also, devoted a good deal of attention to the problem during their congress in 1937. In 1940 Van Beukering of the Department of Economic Affairs summarized the result of the ladang *enquête*.[26] He came to the conclusion that shifting cultivation is a logical and economically justifiable form of land use wherever there is a large amount of land available and a primitive economy exists. From a social point of view no objection can be raised if, after each occupation, the fertility of the soil is regained. There is no reason to insist upon more intensive forms of land use so long as the population density does not increase beyond 50 persons per square kilometer, or 130 persons per square mile. If at this density we

21 From 1830 to 1870 the peasants of Java were forced, under the notorious "culture system," to devote part of their land and labor to producing crops for the government.
22 Kools: Hoema's, 1935.
23 Gonggrijp: "Soil Management," 1938, pp. 397–404.
24 Hagreis: "Ladangbouw," 1930, pp. 43–75 and 629–642.
25 "Enquête betreffende het ladangvraagstuk," 1931, pp. 1022–1033.
26 Van Beukering: Het ladangvraagstuk. Unpublished typescript, 1940.

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allow for five persons per family and assume that the family shifts its cultivation plot annually but returns to the same plot after an average period of 10 years, each family could occupy annually one hectare, or 2.47 acres. This is the amount of land that an average shifting cultivator in the Indies needs in order to cover the food requirements of his family.

This calculation does not make any allowance for permanent forests. Actually, however, the land requirements are not quite so high, because very often the same land is used for two years instead of one, which would either allow for a longer period of fallow or keep a part of the virgin forest intact. The latter is improbable because of the shifting cultivator's preference for virgin forest.

To summarize these opinions, shifting cultivation from the agricultural point of view is not considered objectionable so long as vegetation and the fertility of the soil are restored by nature. The opinion of those who regard it as a fatal agricultural system under all circumstances is widely felt to be unjustified. From the silvicultural point of view, shifting cultivation is held to be objectionable if it destroys timber that would otherwise be exploited by the forest service or by private concessionaries.

Supplementing Shifting Cultivation With Cash Crops in the Netherlands Indies

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The products of the typical shifting cultivator never reach a distant market. There is seldom any surplus, for the shifting cultivator is a subsistence farmer who lives from hand to mouth. In the Outer Islands of the Netherlands Indies, however, the shifting cultivator has been drawn into modern economy and has modified this age-old system. In parts of Sumatra and Borneo he has begun to diversify his economy by planting tree crops on the ladang among his rice or maize. After one or two harvests the fields are abandoned and left to the trees that have been planted. The trees then furnish an additional source of income as soon as they reach the bearing stage. Pepper has been raised as a ladang crop for many centuries, especially in the Lampoeng Districts. Coffee was introduced in the days of the Dutch East India Company and adopted as a commercial crop by the peasants. Benzoin (*Styrax benzoin* Dryander), also, has long been grown in this manner. More recently coconuts and, since about 1905, rubber have become ladang crops (Figs. 25–33).[1]

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A shifting cultivator may, over a period of years, convert his old ladangs into rubber gardens, for example, until he is assured of a sufficient income from his permanent tree crop to buy his food from the outside and no longer requires a ladang for the production of food. This process has led to the creation of the large native rubber areas in Borneo and Sumatra, where some shifting cultivators have become dependent upon the market price of rubber and upon the policy of the government in regard to taxation and export control. In times of low prices and export restrictions they may suffer severe economic setbacks and even hardship. In Bengkalis

[1] [See p. 39 ff, cat. 241 or 116 -- Analyst]

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4 [See p. 27, category 116. -- Analyst]

1,500,000, or at the most 2,000,000, which would mean about 300,000 to 400,000 households. This number of households could hardly occupy such a large rây area as Gourou assumes.

In Formosa only the Malay tribes of the mountains in the eastern half of the island practice shifting cultivation. They number, according to estimates, about 150,000. From this we may assume that not more than 30,000 to 50,000 hectares are occupied annually by shifting cultivators.

In the Philippines it is unlawful to make caiñgins on public land without the permission of the Bureau of Forestry.[34] Permission will be given if the forest on the land involved is of no commercial value and if the caiñgero accepts the obligation to reforest his patch with seeds supplied by the forest service. Several hundred caiñgeros are brought annually before the justices of the peace, who in the past, because their sympathy was with the caiñgeros, were usually rather reluctant to fine the culprits (Table II). Nobody knows, of course, how many illegal caiñgins escape detection, but it is certain that they greatly outnumber those that are made with the permission of the foresters added to those that have been brought to the attention of the courts. Special consideration is given to the "non-Christian" tribes, for whom tracts of land have been set aside within which they continue their age-old system of cultivation. In Mindanao probably three-fourths of the population, from the primitive Manobos to the more advanced Moros, practice the caiñgin system of cultivation. Other regions where this system is practiced extensively are Mindoro, Cebu, southern Negros, and parts of Luzon—the central and eastern cordillera and the Camarines. About 10 per cent of the population of the Philippines obtain a part or all of their food from caiñgins, most of which are made either on private land or on land that belongs to non-Christian tribes who know no other form of agriculture.

Methods of Eliminating the Undesirable Aspects of Shifting Cultivation

In regions where the density of population exceeds 50 persons per square kilometer, shifting cultivation becomes wasteful and destructive. It is imperative in such areas that the system be either modified or else replaced by more conserving and, where possible, more intensive forms of land use. For most backward tribes this involves fundamental changes in their mode of life, religious ideas, and concepts of land rights.

In some instances it should suffice to adopt measures that eliminate the harmful or wasteful after effects of the system without requiring that this kind of land use be given up completely. Let us assume that we have a somewhat thinly settled region containing a forest that is not particularly valuable and the exploitation of which is impracticable or at present inexpedient. Deforestation and the spread of grasses are undesirable aspects

[34] Nano: "Kaiñgin Laws," 1939, pp. 87–92.

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241 311 185 of shifting cultivation in the area. In such a case reforestation would be assured by keeping fire out of the old clearings. This could be done by leaving relatively non-inflammable forest belts at least 60 feet wide between individual clearings. These forest belts would offer some protection against the spread of grass fires and at the same time would be a source of seed for further reforestation. Reforestation under such circumstances would be much easier and cheaper than if large contiguous areas were to be cleared and used.

245 185 [137] Where natural reforestation is particularly slow, cultivators should be required to practice artificial reforestation. In scattered regions in Southeastern Asia tribesmen do this on their own initiative. Pendleton reports such a case in Burma.[35] Certain Dyak tribes in Borneo plant seeds of the candlenut tree (*Aleurites moluccana* Willd.) about 3 meters apart in a freshly cleared ladang before it has even been burned. In the eastern part of the Malay Archipelago shifting cultivators plant such trees as *Aleurites moluccana* Willd., *Erythrina lithosperma* Miq., *Albizzia falcata* Backer, *Hibiscus similis* Bl., *Casuarina equisetifolia* L., *Macaranga* species, *Euphorbia* species, *Sesbania grandiflora* Pers., and *Desmodium timoriense* DC. for the purpose of restoring the forest.

In Sumatra Deli tobacco planters initiated artificial reforestation after alang-alang had regularly invaded their fallow fields and caught fire so frequently that second-growth forest could not get a start. In Deli the tobacco fields are in use only 1 year and lie fallow 7 to 10 years. They should be protected by forest growth during that period. Therefore, in order to make this possible, the planters controlled fires by planting belts of teak along the highways and roads. These belts served as fireguards and at the same time provided lumber for tobacco-drying sheds. On the tobacco fields themselves they planted especially *Albizzia falcata* Backer, *Cassia siamea* Lam., *Pithecellobium saman* Benth., and *Leucaena glauca* Benth., which drive out the alang-alang[36] (Figs. 34–39).

[137] Another way of speeding up reforestation is to spare a few of the larger trees at the time of the clearing. This is done by the Malays of Sumatra. They do not cut down *Koompassia parvifolia* Prain, *Arenga saccharifera* Labill., *Durio zibethinus* Murr. (durian), *Parkia* species, or *Garcinia grandifolia* Pierre.[37] The last three are fruit trees that are numerous in the forest, whereas the second is a palm whose flower stalk is tapped for its sugary sap and the first is preferred by bees as a hiving tree, which gives it its name, "bee-tree." This tree is preserved because the people want the honey. Worthington reports that in Africa "some tribes appear to realize the necessity of maintaining tree growth on their clearings and merely top the trees and lop the branches, so that the trees are enabled to

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[35] Similar cases are known in the residency of Benkoelen in Sumatra, in central Celebes, and in Flores. See Hagreis: "Ladangbouw," 1930, p. 631.

[36] Jochems: "De begroeiing der tabakslanden," n.d., pp. 77–89.

[37] *Ibid.*, pp. 30–32.

[See p 40 ff, cat 116 --Analyst]

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recuperate quickly when the area is again allowed to revert to bush."[38]

Several of the forest services of Southeastern Asia have made a rather successful use of the shifting cultivator in their endeavor to reforest the land. They have combined shifting culture and silviculture by hiring shifting cultivators to cut mature trees and to sow or plant new trees on cut-over or burned-over land. For this the cultivators are paid a small wage. In addition they are allowed to grow their own crops for one or two years between the rows of young trees. This system, known as the "taungya forestry system," was developed in 1856 by the German forester, Dietrich Brandis, while he was Superintendent of Forests in Pegu, Burma.[39] It is ingenious in that it recognizes the habits of the shifting cultivator and fits them into a modern forest economy instead of persecuting the cultivator and forcing him to give up his traditional culture. This system has been used in the teak forests of Java since 1871. The forest service makes a contract[40] with the peasants of Java according to which the peasants are to prepare the land and plant and take care of teak trees (*Tectona grandis* L.) in return for a small sum of money and the right to plant such crops as maize and red pepper (*Capsicum annuum* L.) between the rows of teak. The cultivation of upland rice is discouraged, and the planting of cassava, peanuts, castor beans, and tobacco usually is not allowed (Figs. 40, 41).

The taungya forestry system is an excellent way of getting pure stands of commercial timber. The typical forest of the tropics is expensive to exploit because of the large variety of trees which it contains, many of which have little or no commercial value.[41]

As important as reforestation is soil erosion control. Where shifting cultivation is practiced in mountainous regions it often causes such acceleration in the rate of erosion that the rivers are choked with sediment and periodically do great flood damage. Flood control could be achieved in most cases by completely closing the headwaters and watershed areas to cultivators. On more gentle slopes the clearings should be rather narrow, should parallel the contours, and be separated by belts of forest. If at the same time the forest uphill were protected by fireguards, the clearings would have a chance to close quickly again so that the soil would be

[38] Worthington: Science in Africa, 1938, pp. 378–379.

[39] *Taungya* is the Burmese term for the temporary field of the shifting cultivator, a term that the foresters have adopted. E. P. Stebbing in his work, The Forests of India, Vol. 1, 1922, p. 376, writes:
"Brandis, moreover, recognized that the very system which, till then, had destroyed teak forests might be utilized to produce them, . . . and as early as 1856 an attempt was made in Prome district to sow teak in regular rows, together with the rice scattered by the toungya [*sic*] cutters. Twenty years afterwards this attempt had grown into a regular system, by which areas were being annually stocked with teak at a cost far below that of regular plantations." See also *Ibid.*, Vol. 3, 1926, pp. 415–428.

[40] Becking: "De djaticultuur op Java," 1928, pp. 50–52.

[41] Heske: "Der tropische Wald," 1939, p. 414. Heske's article gives an excellent short account of the forests of Southeastern Asia and points out that they are on the whole much easier to exploit than are the forests of tropical America because of the abundance of cheap labor.

[See p. 41, cat. 1H -- Analyst]

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protected against abnormal erosion. Terracing would be the most effective method of checking soil erosion, but this requires a good deal of labor, which is scarce in areas of shifting cultivation.

The Forestry Service of the Indies started an interesting soil-erosion experiment near Tjiwidej in the mountains south of Bandoeng at an elevation of 1800 meters. Two adjacent parcels of forest land, lying on rather steep slopes, are drained separately—out of each parcel comes a little brook—and thus form separate drainage units. Both parcels were used by shifting cultivators who had cut and burned the forest. In one case the slope was left undisturbed; in the other the slope was terraced. At the foot of each slope catch basins were constructed to retain the sediment that was washed down by rain water and transported by the brooks. The amount of water that drains out of each unit was measured and the sediment weighed. The purpose of this experiment was to get quantitative measurements of the amount of erosion that is caused by shifting cultivation and to study the effect of terracing in reducing soil loss. During the first year both parcels lost very little soil, because the humus layer protected it; but in the second year the unterraced parcel lost 5.065 kg. of silt per square meter whereas the terraced parcel lost only one-half as much, or 2.524 kg.[42] (Figs. 42–45).

Under the conditions that we have discussed so far, no radical change in the system of cultivation is required. If, however, the population increases to such an extent that there is no longer enough available land to allow for a sufficiently long rotation cycle, more drastic remedies are necessary.

Such a situation arose in parts of the Outer Islands and attracted the attention of government specialists. Legal experts familiar with Indonesian customary law, foresters, and agricultural advisers collaborated to seek a solution.[43] Realizing that shifting cultivators are usually reluctant to give up their traditional form of land use, the specialists approached the ladang problem by searching for means of reforesting ladangs quickly. Experiments were made with the planting of quick-growing leguminous and non-leguminous trees, bushes, and shrubs to shorten the fallow period, restore the humus, protect the soil against accelerated erosion, eliminate the grasses, and, in the case of leguminous species, improve the soil by adding nitrogen.[44] We have already seen, however, that artificial refor-

[42] I was able to visit the Tjiwidej experiment with Mr. L. Gonggrijp, under whose supervision the work was carried out. For a detailed report on the project see Gonggrijp: "Het erosie-onderzoek," 1941, pp. 200–220.

[43] H. J. Friedericy of the Department of the Interior and H. Vonk and E. J. Wind of the Department of Economic Affairs, for example, worked together on the problem of ladang culture in the residency of Palembang.

[44] Experimental plantings included, among others, *Erythrina lithosperma* Miq., a light-loving tree which is typical in Southeastern Asia of dry, rather open climax forests and of second-growth forests; *Hibiscus tiliaceus* L.; *Albizzia falcata* Backer, one of the fastest-growing trees of Southeastern Asia, used widely as a shade tree on coffee plantations; *Aleurites moluccana* Willd., a tree at home in the drier parts of the East Indies; *Leucaena glauca* Benth.; *Pterocarpus indicus* Willd., a large tree frequently used along roadsides as

1 [see p. 42, category 16 -- Analyst]

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estation is not a discovery of Western-trained scientists but has long been practiced by certain groups in Southeastern Asia. It was the plan of the government to spread and enforce this practice of artificial reforestation wherever advisable. This practice, whereby the cultivator determines the vegetative cover during the fallow period instead of abandoning the ladang to chance growth, brings him to a transition stage between shifting cultivation and permanent cultivation. From there the step to permanent cultivation with crop rotation is but a short one.

Permanent cultivation requires repeated tilling and therefore more labor and tools than the shifting cultivator is accustomed to. Work animals are also desirable. An important obstacle to intensification of agriculture in wide areas of Southeastern Asia, however, is the fact that hill and mountain regions [up to about 1500 meters in elevation] are frequently infested with malaria so that the energy of the people is greatly reduced.[45] Moreover, the acquisition of such implements as plows, harrows, and hoes, and especially of work animals, calls for financial resources or credit, both of which the average shifting cultivator lacks. Some shifting cultivators do own livestock, such as cattle or carabaos, but utilize neither their labor nor their manure. Groups of the Mois in the mountains of Annam have carabaos, but they do not use the animals in their agricultural activities because they "cannot talk" to them.[46] On the Lesser Sunda Islands livestock is kept because it gives social prestige to the owner. Overstocking of the pasture areas on these islands has led to overgrazing and has cut into the forest area until there has developed a scarcity of land suitable for ladang cultivation. The same has happened in large areas in Africa. There it has been necessary to teach the native peasant the use of cattle and make him familiar with the plow. This was done successfully in northern Nigeria by combining the animal husbandry of the nomadic Fulani with the indigenous shifting cultivation of the Hausa peasant, thus developing "a system of permanent farming whereby a man with cattle of his own, say two working oxen and a few cows, can plough and maintain in fertility an area of land sufficient to supply all the requirements of himself and his family, and to obtain a surplus balance as a return for his labour. . . . Thus mixed farming represents a gradual evolution from the shifting methods of cultivation to a static type of agriculture, by the introduction of animal husbandry, and with the use of animal cultivation."[47] Above all, the peasant learns to preserve the animal manure and

a shade tree; *Dolichos lablab* L., a climbing herb which is valuable as a vegetable; *Crotolaria anagyroides* H.B. and K., a bush of vigorous growth which attains a height of from 12 to 14 feet and forms an excellent green manure; *Tephrosia candida* DC. and *Tephrosia vogelii* Hook., low shrubs useful as green manures; and *Mimosa invisa* Mart., a leguminous creeper which suppresses grasses.

[45] Gourou: L'utilisation du sol, 1940, pp. 181 and 350.

[46] *Ibid.*, p. 354.

[47] King: "Mixed Farming in Northern Nigeria," 1939, p. 271. See also Faulkner and Mackie: West African Agriculture, 1933; and by the same authors: "The Introduction of Mixed Farming in Northern Nigeria," 1936, pp. 89–96.

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to apply it regularly to his fields in order to keep up the fertility which formerly was restored through long forest fallow. This animal fertilizer is more important than the help the peasant gets from his animals in the way of labor. Thus the area to be cultivated may be limited by the amount of manure available, rather than by the extent of land that can be plowed.

Van Beukering, in his summary of the results of the ladang *enquête*, is of the opinion that similar practices should be introduced in the Outer Islands of the Netherlands Indies; but the pasture problem must first be carefully studied before mixed farming can be widely established in the Indies. Where animal manure is not available, the composting of vegetable waste, or even of crops grown for this specific purpose, supplies an excellent fertilizer.

The intensification and modification of shifting cultivation are less difficult in flat country than on sloping land where there is the hazard of soil erosion. Perhaps the most obvious solution would be to move the population from mountainous land to the plains and valley floors, but this can be done only in areas where population density is low. In Southeastern Asia the density of population on the plains is usually so high that, should it be possible to bring malaria under control, a movement from the plains to the uplands and mountains would be desirable rather than a migration in the opposite direction. Another solution would be to have the shifting cultivator plant permanent tree crops to protect the soil against accelerated erosion. Steep slopes which now produce but a single moderate rice crop every few years could be made more productive if planted with perennials. The cultivator could then buy his staple food with the money obtained from the sale of the crops harvested from his trees.

The speed with which the change from shifting cultivation to permanent cultivation may be made will depend both on the geographical environment and the cultural level of the community. Shifting cultivators with permanent villages and a regularly established rotation of fields will respond much more readily to a reform brought from the outside than a group that is always ready to abandon its dwellings and move to a new locality.

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land. An example is *mongo* (*Phaseolus mungo* L.), grown in Pangasinan and Batangas. Alarmed by the poor rice crops in 1940 and the difficulty of importing rice from Indochina and Thailand, the Philippine Bureau of Plant Industry, early in 1941, started to distribute seed of quick-growing dry-field crops, especially maize and legumes, in order to supplement the nation's rice bowl. But the average Filipino farmer is reluctant to accept this new practice, because "it is not the custom"—a powerful argument not to be easily overcome.

Dry-Field Crops Cultivated by Plantations

The discussion thus far has been limited to the native cultivation of dry land and to annual crops. However, extensive areas of non-irrigated land are occupied by perennial crops that are grown on plantations owned by Westerners. The crops produced include tea, coffee, cacao, quinine, rubber, palm oil, coconuts, kapok, sisal, and other fibre plants. Some of these crops were cultivated for a long time without the proper measures being taken to protect the soil against accelerated erosion. Although the detrimental effects of plantation agriculture in Ceylon and southern India are notorious in the plantation history of southern Asia, results were just as disastrous in Malaya and in the Netherlands Indies. Westerners, accustomed to clean cultivation or clean weeding in the temperate zone, carried this practice over into the tropics, with the result that soil erosion was very severe on steep slopes and led to great losses in soil fertility. Today, however, these mistakes have been recognized; there is hardly a plantation that has not adopted measures to protect sloping land against erosion and level land against soil exhaustion. The planters of Java were the pioneers in this field, introducing or developing most of the protective measures. These measures include contour drains, silt pits, contour ridges, terraces, hedges, shade trees, and especially cover crops. The use of these measures varies according to the crop, or crops, produced and according to climate, soil, and slope; but the purpose of all of them is to encourage an effective ground cover and to check the rate of water run-off. The financial depression of the 1930's—resulting in the need for very strict economy and a decrease in production costs—has helped considerably to reduce the amount of clean weeding and to convince conservative planters of the value of preserving a ground cover, litter, and mulch. Such measures help not only to retard erosion but also to enrich the soil. The first Western planter who broke away from the custom of keeping the ground of his plantation free from weeds was L. M. Tyl, who in the years 1890–96 developed the "weed-system" and thus introduced the idea of a ground cover into plantation circles of Southeastern Asia. But it took many years before his idea was generally accepted. It is interesting to note here that the Asiatic-owned plantations and the small holdings producing perennial crops, such as rubber, usually did not practice clean weeding. This, in the early days, was regarded by European observers as a sign of laziness and

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poor management, but, as has been so often the case, the Westerners were finally forced to admit the soundness of Oriental cultivation practices.

As we have seen, there are two principal means of protecting the soil between tree crops: by allowing the growth of indigenous plants or weeds (in other words the development of a natural mixed cover), or by establishing a pure cover of leguminous plants, many of which came originally from the New World. Rubber planters in Malaya seem to have had more success with the first method, which has been called "the forestry method of cultivation" or "rubber forestry." [67] Of course, the growth of indigenous plants or weeds must be controlled, and this is done by slashing the undergrowth from time to time. Frequently it is necessary to practice selective weeding in order to suppress undesirable plants and encourage more valuable ones.

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Much research has been directed toward the study of leguminous cover crops which supply nitrogen, as well as foliage for green manure. This research was started in 1910 in the Botanical Garden at Buitenzorg. Some of the cover crops that have proved especially valuable and are widely used on modern plantations are *Calopogonium mucunoides* Desv., *Centrosema pubescens* Benth., *Centrosema plumierii* Benth., *Desmodium* species, *Tephrosia candida* DC. and *Tephrosia vogelii* Hook., *Mimosa invisa* Mart., *Cassia* species, and *Vigna oligosperma* Backer.[68] Several of these have already been mentioned in the foregoing discussion on the use of green manure crops in native agriculture.

Because a number of perennials such as tea, coffee, and cacao are commonly grown under shade trees, many writers seem to believe that these plants need shade. This may be true in part, but more important is the fact that the shade trees protect the soil against excessive losses of moisture and undesirable changes in soil composition, texture, and structure and thus prevent a reduction of the quantity of humus in the soil. Most of the commonly used shade trees are legumes which, in addition to shade, supply litter and nitrogen and help to increase the moisture-holding capacity of the soil, thus reducing the danger of erosion. *Erythrina micropteryx* Poepp., *Erythrina lithosperma* Miq., *Leucaena glauca* Benth., *Albizzia moluccana* Miq., *Albizzia chinensis* Merr., *Albizzia falcata* Backer, *Pithecellobium dulce* Benth., or Manila tamarind, and *Peltophorum pterocarpum* Backer are especially useful in this respect.

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[67] Haines: "The Uses and Control of Natural Undergrowth," 1934.

[68] For a very extensive list of cover crops, green manures, and shade trees, see Heyne: De nuttige planten van Nederlandsch-Indië, Vol. 3, 1927. See also International Institute of Agriculture: *op. cit.*

development who fear that these countries might not be able to expand their production faster than population expands, in which case the result of economic development efforts will be a greater quantity of people with little or no gains in the quality of living conditions. In Zinkin's words, "The growth of population and the impact of the West have between them, in the last hundred years, so upset the delicate balance that most of the Asian countryside is now bankrupt . . . . The alarming feature of the peasant economy of Asia is not simply that it is desparately poor. It is that in recent decades, and in most countries of Asia, it has been growing poorer. It is a changing, dynamic economy. But it has been changing for the worse."[23]

Poverty is not new in Southeast Asia. What is new is the awareness of poverty and the conviction that something can be done about it. "A great change", reported Harold Butler, "is stirring Eastern society. The consciousness of misery has been created by the growing realization that it is not the inescapable lot of the poor and that chances of better life now exist."[24] All of the countries in Southeast Asia have within the past decade set up official agencies charged with planning and promoting economic development; and for international assistance to hasten it, is the constant

23. Zinkin, op. cit., p. 34.

24. Harold Butler, Problems of Industry in the East (Geneva: International Labor Office, 1938, Studies and Reports, Series B, No. 29), pp. 65-66.

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648 theme of their spokesmen in the economic and social organs
• 185 of the United Nations. It is probably too early at this moment to speculate on the outcome of Southeast Asia's
000 determination to industrialize. Much can be said, however, about the element of urgency and speediness commonly attached to each project of industrial development envisaged by each of these countries. "For successful development," cautions Staley, "two things are necessary: a substantial and continued economic advance -- and a social and political outcome which produces self-reliant citizenship in a free society, stable and responsive democratic government, and cooperation with other free societies."[25] The same writer warns that if capital investment and material technology are puched energetically in an underdeveloped country while little or no attention is given to deliberate promotion of appropriate social and psychological change, the result is likely to be either a failure of the development process to "take" and become "self-generating" or creation of a menace to the free world.[26] Garner also gives similar warning, "People have to develop themselves before they can change their physical environment, and this is a slow process."[27]

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44 A most important factor that has kept Southeast Asia economically underdeveloped is the small size of market in

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25. Staley, op. cit., p. 202.

26. Ibid., p. 203.

27. Ibid., p. 203.

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health and welfare induced the governments throughout the region to legislate that laborers be recruited with full knowledge of, and with a physique adequate to, the conditions of their future work; that they receive medical care and compensation for illness and injury; that certain minimum wage standards and a maximum number of working hours be maintained, either by district or by industry; that women and children be not employed in tasks beyond their strength. Everywhere labor inspectorates were created to see that the labor laws were enforced, but because of budgetary limitations they were hardly ever equal to their task. Though these were undoubtedly steps in the right direction they were far from adequate. Much of the legislation in the colonies was taken over from that of the home country or other colonies and only partially adapted to local conditions. Often it was wholly inappropriate to the area where it was applied. Even where it was at first applicable, it did not necessarily remain so, because industries and occupations changed; and invariably it covered only a fraction of the total labor force in the country. Further, inspectors usually lacked the time and the authority to see that even the few laws on the statute books were enforced. More complete, more specifically focussed, and more generally applicable labor laws were needed.

Having enacted measures designed to keep order and protect the laborer's physical well-being and the proceeds of his toil, the governments of the region felt that they had few additional obligations toward their wage-earning population. Conditions in Southeast Asia were sufficiently better than those prevailing in southern India and in China to attract all the labor that was needed; and this lulled the governments into believing that even if the territories under their sway had not achieved a labor millennium, there was no urgent need to do more. However, on the eve of the Pacific War, certain of the governments became more active in projecting further labor codes and reforms, long held under consideration.

Although embryonic associations of workers existed in each country of Southeast Asia, they did not grow and coalesce to become important economic entities. No genuine trade-union movement had developed before the war broke out in the Pacific. Such associations as formed invariably occurred first among transport workers, since railroads, tramways and harbor operations were the first industries created in the area and since they could most easily be held up by strikes and found it most difficult to replace their workers even when there was a large surplus supply of general laborers. Moreover, the workers in them were fairly well concentrated geographically. The delayed growth of unionism in others of the larger enterprises is explained by the extremely small minority of industrial workers amid the large and unassimilable blocs of foreign laborers, and by the indifference of the governments to the formation

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181 local custom and religious rule, had been present for centuries. But there
177 was little in the economic situation to sharpen it, and the Muslim leaders
565 themselves were often so steeped in the local ways that they allowed as the
602 religious law what was, in fact, the local custom. With the growth of
776 Western processes, the perception of new economic advantages tended to
779 change the equilibrium of the two principles. The advance of education
671 and heightened consciousness of Islam as a world faith also tended to make
182 the religious leaders themselves much more keenly aware of any divergence. Wealthy men who want to leave property to their sons, men with a strong religious sense, men who regard themselves as progressive, or who are in revolt against their clan leaders, therefore tend to be protagonists of the Muslim law. The conservatives, those who see in the custom a defence for women, those who see in it a symbol of an essentially Malay way of life, argue for the retention of the custom. Contact with the West, they say, is changing the structure of the peasant society enough already. The issue has also entered the modern political scene, since the search for factors to increase Malay integration tends to stress the national and extra-national character of Islam at the expense of the more local qualities of the *adat*. Here too it is growing Westernization which has sharpened the issue.

184 In a general discussion such as this, one may be allowed to refer to the
565 peasantry of South East Asia as a body. But they are not uniform in ethnic composition, in national interests, in language, in religion, or in general culture. Moreover, within any local community, there are competing, even conflicting, interests and opinions. The peasant may be unable to face up to the general issues which affect his life so deeply, but in so far as he understands his own interests he is very alive to them and capable of exercising keen judgement in them. It is the small scale of his organization for the most part which renders him so vulnerable.

000 What is likely to be the future of South East Asia from the peasant angle? Prediction is not worth much, since so many elements in the situation are imperfectly known, but there are a few which seem to be significant.

565 The peasant has no native middle class, of the same society as himself,
● 185 to give a lead to his development and stability in any wider economic
656 organizations that may be set up for his benefit. To improve his economic lot, and in particular to give him a larger fraction of his product through control of marketing, co-operative societies have often been proposed and sometimes tried. Their success has been only limited, partly because the peasant has not been fully persuaded of their attractions as against what the alien middleman can offer, and partly because of the difficulty of securing adequate technical supervision and administration at a sufficiently low official level. Much is now apt to be made of the colonial or semi-colonial status of the South East Asian peasant as a drag upon his development. There is no doubt that colonialism, as a specific form of political control of under-developed territories by a metropolitan Power, is

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nearing the end of its historical phase. How far it is likely to be replaced by a more insidious form of satellitism is not relevant here. But to talk about political emancipation of South East Asia being the prime requirement for the solution of the problems of the peasantry must not obscure the economic factors involved. Nor is fresh capital all that is needed. For the economy of the peasant to attain a relative stability a great development of technical and administrative skills in the commercial field is necessary. The building of a native professional class would seem to be an important element in the construction of a more integrated economic and political system. To concentrate attention on the political factors alone is to overlook the fact that most of the sinews of the economic organism are now provided by the one group which does not have overt political power—the Chinese.

What remains of the traditional class structure in South East Asian society is not of much avail as a defence of the peasant from alien exploitation. In any case, though the rulers and traditional nobility still command much respect, and provide symbols for the unity of the people, there are stirrings of resentment among the people against the perpetuation of a system in which these aristocrats do not perform recognizable services at commensurate incomes. But such resentment does not mean that the peasantry are dry tinder for the spark of Communism to set alight. Communism as yet does not seem to have any great attraction for the mass of the local peasantry of the South East Asian region. The lack of popular response to the Malayan insurrection has shown this. It is presumably true to say that the interest of the peasant can always be secured in any movement which promises to give him greater control of the land—more land more secure tenure, freedom from land debt, and better returns for his produce. But to most of the Indonesian peasants these aims are likely to be sought in nationalism, which can be largely given both an ethnic base and the religious sanctions of Islam. The person to whom the cry for a solution of the land problem is likely to make a most definite appeal, especially in Malaya, is not the Indonesian but the Chinese peasant, who sees himself as excluded from full participation in the land rights of the country folk. Over and over again one hears the cry, ill-founded as it is, that the Chinese have not been allowed to grow rice in Malaya.

Here may well come one of the acute pressure points in the South East Asian scene. The analysis might go as follows. Nationalism is a powerful political force because of its appeal to the individual in a projected, enlarged form of his desires and strivings. But by itself it is an aggressive rather than a constructive force. It lacks a coherent theory for the use of the resources at its control. An ideology containing such theory, and an equally ardent emotional charge on the part of many of its adherents, is provided by Communism. If Communism can work through nationalism it has a most powerful combination. Yet Communism in South East Asia lacks organization of any scale. The optimum conditions for its success are